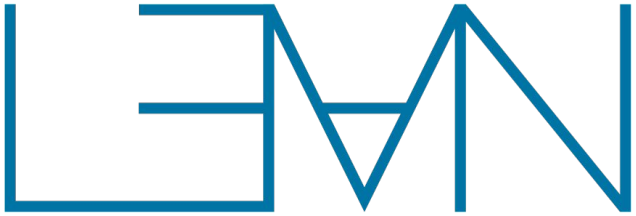


Report from the FRO
Lean Workshop @ ITP 2025

Joachim Breitner
Principal Research Software Engineer

October 2nd, 2025, Reykjavik

FRO what?

Lean FRO Mission

Our mission focuses on enhancing **Lean** in key areas: **scalability**, **usability**, **documentation**, and **proof automation**, while also broadening its application in various fields such as **education**, **research**, and **industry**. Over the next five years, we are dedicated to advancing Lean's capabilities and expanding its influence, ensuring it becomes an indispensable tool in these diverse domains. A pivotal aspect of our mission is to steer Lean towards **self-sustainability**, laying a strong foundation for its enduring growth and widespread utilization.

lean-lang.org/fro/roadmap

π

Formal mathematics

Software/Hardware verification

AI for math and code synthesis

Math and CS education

Lean FRO Genesis

Founded by

Leonardo de Moura
Sebastian Ullrich
(August 2023)

Funded by

Simons Foundation International
Alfred P. Sloan Foundation
Richard Merkin Foundation
Alex Gerko
Convergent Research

Lean FRO Team

Lean FRO Team


Leo de Moura


Sebastian Ullrich


Ashley Blacquiere


Henrik Böving


Joachim Breitner


David Christiansen


Sebastian Graf


Markus Himmel


Marc Huisinga


Mac Malone


Joscha Menniken


Kyle Miller


Kim Morrison


Jason Reed


Paul Reichert


Sofia Rodrigues


Wojciech Różowski


Rob Simmons


Cameron Zwarich


Anne Baanen


Joseph Rotella


Johan Commelin

Lean FRO Growth

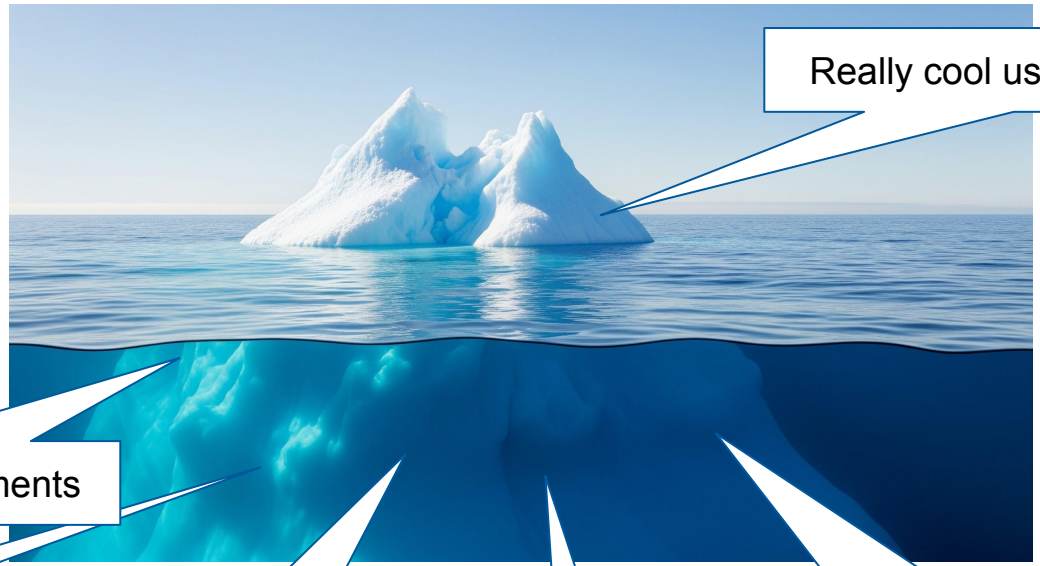
July 2025: New funding

Alex Gerko, CEO and founder of XTX Markets, donates $5M to the Lean FRO. New team led by Jason Reed to focus on tooling and UX.

Alex Gerko, yes, the same one, donates $5M to found the **Mathlib initiative**. Led by Johan Commelin, Adam Topaz and Olivier Nash.

Lean highlights

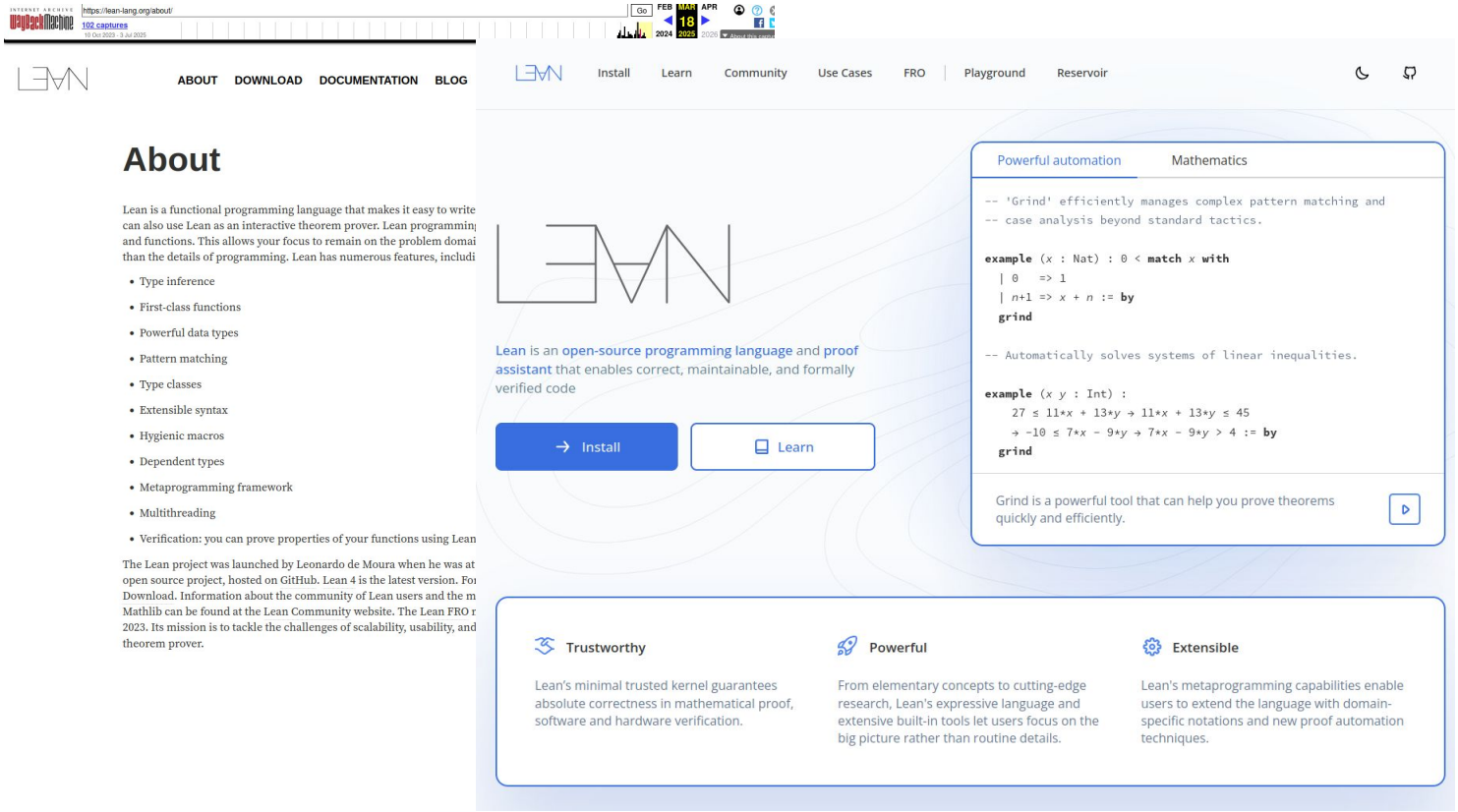
Lean highlights



Demo time

https://github.com/nomeata/lean-workshop-2025

New homepage



Lean highlights of the past year

New in Lean 4.12…4.24 (highly subjective selection)

- New tactics: `bv_decide`, `grind`, `fun_induction`, `try?`, `mvcgen`
- New definitions: `partial fixpoint`, coinductive predicates, nested well-founded recursion
- Incrementality and parallelism
- Language Server & Code plugin: Inlay hints, Gutter decorations, unknown identifier code action, import hierarchy, Signature Help, structure auto-completion, overloaded go-to-def
- Usability: suggestions in error messages, better error messages, tactic configuration syntax,
- Library: map containers, iterators, systematic library development
- Module system
- Lake: local artifact cache
- Reference manual (and verso), named error messages
- New homepage

Year 3 Roadmap

Year 3 roadmap (selection)

- Module system for the masses
- Universal `rw` tactic
- Counter-example generation
- `do`-notation refactoring and integration with `mvcgen`
- Async/await and HTTP server functionality
- Cloud cache and version resolution in lake
- …and performance and usability improvements throughout

Full roadmap online

Questions?